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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,525	10/23/2000	Gee L. Lui	D-387	4895
7590	05/04/2004		EXAMINER	
Derrick M. Reid Patent Attorney The Aerospace Corporation P. O. Box 92957 (M1/040) Los Angeles, CA 90009-2957			NGUYEN, DUNG X	
			ART UNIT	PAPER NUMBER
			2631	3
DATE MAILED: 05/04/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/696,525	LUI ET AL.	
	Examiner Dung X Nguyen	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 23 Ocyober 2000.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1 - 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1,2,4 - 6, 12 - 17 is/are rejected.
- 7) Claim(s) 3, 7 10, 11 18, and 19 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) Interview Summary (PTO-413) Paper No(s). _____ .
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____ .

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: In page 1, lines 27 – 28 of the specification, the S/N xx/xxx,xxx, filed YY/YY/YY are uncorrect. Are they S/N 09/694,650 filed on 10/24/2000. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. **Claims 8, 9, and 17 are rejected** under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 8, 9, and 17, is where the value of *k*?

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1 and 12 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Lim (US patent # 6,151,367) and Abaunza et al. (US patent # 5,089,822), and further in view of Markarian (US patent # 6,208,201 B1).

Regarding claim 1, Lim discloses:

- Low pass filter (4), A/D converter (6), low pass filter (5), and A/D converter (7) of figure 1 corresponding to an in-phase isolator and a quadrature isolator for respectively isolating the sampled in-phase and quadrature-phase components of the sampled input signal for respectively providing an in-phase (I) signal and a quadrature-phase (Q) signal (column 1, lines 13 – 22);
- Pilot filter (117) comprising blocks 118 and 119 of figure 8 corresponding to an in-phase error generator and a quadrature error generator for receiving and filtering the I and Q signals, for respectively generating and sampling I error and Q error signals for respectively generating a sampled I error and Q error signals. Since it provides a respective error signals then providing a respective error magnitude signals are on hand of one in ordinary skill in the art.

While Abaunza et al. discloses:

- Sampler and demultiplexor circuit (3), FIR filter (5), and digital DPSK demodulator (7) of figures 1 and 2 corresponding to an in-phase (I) demodulator and quadrature-phase (Q) demodulator for respectively receiving and filtering the in-phase (I) signal and the quadrature-phase (Q) signal for generating an in-phase (I) filter response and a quadrature-phase (Q) filter response, and for converting and sampling the odd and even filter response into odd data and even data alternatively forming an estimate of the input data (column 5, lines 36 to column 6, line 54 and column 3, lines 26 - 68);
- The in-phase (I) mixer (49) and the quadrature-phase (Q) mixer (47) of figure 2 for respectively mixing the sampled I and Q difference (error) signals with the odd data and the even data, and it would have been obvious for one in ordinary of the art at the time the instant claim invention was made to make the odd data and even data

represented only the signs (according to the polarities) of the I and Q signals (column 6, lines 36 – 54 and column 3, lines 48 - 68).

Finally, Markarian discloses that the oscillator (VCO 28) of figure 2 for generating the timing signal from the even error signal (50) and the odd error signal (44), the timing signal for controlling the sampling of the in-phase serial data demodulator and the quadrature serial data demodulator and for sampling of I and Q error generators for generating the timing at a rate of the symbol sequence (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Lim, Abaunza et al., and Markarian to provide a fulfill requirements of the limitations of the instant claimed invention for improving the communication system.

Regarding claim 12, the limitations are analyzed in the same manner set forth as claim 1.

6. **Claims 2, 4 – 6, 13, and 16 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Lim (US patent # 6,151,367) and Abaunza et al. (US patent # 5,089,822), Markarian (US patent # 6,208,201 B1), and further in view of. Lévy et al. (US patent # 4,355,214).

Regarding claim 2, Markarian further discloses:

- Loop filter (blocks 26, 30, 31, 46, 56 52, 36, 35, 27, 58, 28) for receiving the odd error signal and the even error signal for providing a filter error signal (see figure 2);
- VCO (28) corresponding to a controlled oscillator for receiving the filter error signal from LPF (58) for generating the timing signal.

While Lévy et al. discloses that the modulo (4) counter (65) within the echo canceller (60) of figure 4 for providing an odd timing signal for sampling the in-phase (I) magnitude error signal, and for providing an even timing signal for sampling the quadrature-phase (Q) magnitude error signal (column 14, lines 1 – 21).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Lim, Abaunza et al., Markarian, and Lévy et al. to provide a fulfill requirements of the limitations of the instant claimed invention for improving the communication system.

Regarding claim 4, followed by the limitations analyzed in claim 1, Abaunza et al. further discloses:

- FIR filter (5) of figures 1 and 2 comprising respectively filter principal components of the in-phase and quadrature-phase signals for providing odd and even filter responses. The main point here is respectively filtering the principal components of the in-phase and quadrature-phase signals for providing odd and even filter responses, not in the specific name of Laurent, thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide respectively principal Laurent components of the in-phase and quadrature-phase signals for providing odd and even Laurent filter responses; and
- Digital DPSK demodulator (7) of figures 1 and 2 respectively samples the odd and even filter responses for generating the odd and even data. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide respectively demodulators for respectively generating the odd and even data.

Regarding claim 5, followed by the limitations analyzed in claim 1, Lim and Markarian further inherently disclose that an input sampler for sampling the received signal into sampled input signal sampled at a rate of timing signal.

Regarding claim 6, followed by the limitations analyzed in claim 1, Abaunza et al. further discloses that in figure 7, putting the odd and even data into the estimate of the input data.

While Lim further discloses the multiplexer (184) of figure 18 for selectively outputting the signals according to the control signal (column11, lines 23 – 24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Lim, Abaunza et al., Markarian, and Lévy et al. to provide a fulfill requirements of the limitations of the instant claimed invention for improving the communication system.

Regarding claim 13, the limitations are analyzed in the same manner set forth as claim 2.

Regarding claim 16, the limitations are analyzed in the same manner set forth as the combination of claims 5 and 6.

7. **Claim 15 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Lim (US patent # 6,151,367) and Abaunza et al. (US patent # 5,089,822), Markarian (US patent # 6,208,201 B1), and further in view of Durrant et al. (US patent # 5,963,586).

Regarding claim 15, followed by the limitations analyzed in claim 12, Abaunza et al. further discloses:

- Blocks 3, 5, 7 of figure 3 corresponding to the transformer of the respective in-phase and quadrature-phase signals and it would have been obvious to one of ordinary skill in the art at the time the instant claimed invention was made to make transformers for respectively in-phase and quadrature-phase demodulators;
- FIR filter (5) of figure 3 comprising respectively filter principal components of the in-phase and quadrature-phase signals for providing odd and even filter responses. The main point here is respectively filtering the principal components of the in-phase and quadrature-phase signals for providing odd and even filter responses, not in the specific name of Laurent, thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide respectively principal Laurent components of the in-phase and quadrature-phase signals for providing odd and even Laurent filter responses; and
- The odd and even data alternately forming an estimate of the input data sequence (see figure 7 and column 10, lines 30 – 40).

While Durrant et al. discloses that hardlimiter (2003) of figure 21A and the technique of sampling of the respective in-phase and quadrature-phase signals (column 2, lines 38 – 40).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Lim, Abaunza et al., Markarian, and Durrant et al. to provide a fulfill requirements of the limitations of the instant claimed invention for improving the communication system.

8. **Claim 14 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Lim (US patent # 6,151,367) and Abaunza et al. (US patent # 5,089,822), Markarian (US patent # 6,208,201 B1), and further in view of. Lévy et al. (US patent # 4,355,214) and Schmidl et al. (US patent # 6,546,055 B1).

Regarding claim 14, followed by the limitations analyzed in claim 12, Abaunza et al. further discloses:

- FIR filter (5) of figure 4 and figure 5 corresponding to early-late gates function comprising respectively filter principal components of the in-phase and quadrature-phase signals for providing cross correlating the odd and even filter responses. The main point here is respectively filtering the principal components of the in-phase and quadrature-phase signals for providing odd and even filter responses, not in the specific name of Laurent, thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide respectively principal Laurent components of the in-phase and quadrature-phase signals for providing odd and even Laurent filter responses.

While Markarian further discloses:

- Loop filter (blocks 26, 30, 31, 46, 56 52, 36, 35, 27, 58, 28) for receiving the odd error signal and the even error signal for providing a filter error signal (see figure 2);
- VCO (28) corresponding to a controlled oscillator for receiving the filter error signal from LPF (58) for generating the timing signal.

And Lévy et al. discloses that the modulo (4) counter (65) within the echo canceller (60) of figure 4 for providing an odd timing signal for sampling the in-phase (I) magnitude error signal, and for providing an even timing signal for sampling the quadrature-phase (Q) magnitude error signal (column 14, lines 1 – 21).

Finally, Schmidl et al. discloses that the DSP (176) of figure 9 synchronizes receiver (140) to the timing of the data frame (column 11, lines 10 – 11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Lim, Abaunza et al., Markarian, Lévy et al., and Schmidl et al. to provide a fulfill requirements of the limitations of the instant claimed invention for improving the communication system.

Allowable Subject Matter

9. **Claims 8, 9, and 17 would be allowable** if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. **Claims 7 and 18 - 19 are objected** to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Vankka (US patent # 6,693,970 B1) discloses a QAM modulator.

Goeddel et al. (US patent # 6,665,356 B1) discloses a sample timing control for demodulation of phase-modulated signals.

Torii (US patent # 6,219,534 B1) discloses a radio communication apparatus.

Takigawa et al. (US patent # 6,3208,201 B1) discloses a receiver.

Markarian (US patent # 6,389,082 B1) discloses a carrier signal from a modulated input signal.

Lim (US patent # 6,151,367) discloses a digital demodulator.

Rishi (US patent # 6,127,884) discloses a differentiate and multiply based timing recovery in a quadrature demodulator.

Strolle et al. (US patent # 6,389,082 B1) discloses an apparatus for generating timing signals for a digital television signal receiver.

Bi (US patent # 5,623,485) discloses a dual mode code division multiple access communication system and its corresponding method.

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung X. Nguyen whose telephone number is (703) 305-4892. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Ghayour Mohammad H. can be reached on (703) 306-3034. The fax phone numbers for this group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

DXN

April 29, 2004

